DOCUMENT RESUME

ED 202 590 PS 012 192

AUTHOR Brink, Satya
TITLE Children's Safety in the Residential Environment.
PUB DATE Apr 81
NOTE 14p.; Paper presented at the National Conference on Childhood Accidents and Prevention (1st, Ottawa, Ontario, April 13-15, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Accident Prevention; *Accidents; Building Design; *Children; *Family Environment; Foreign Countries; Injuries; *Safety; Safety Education
IDENTIFIERS *Canada

ABSTRACT

The incidence and causes of children's accidents in the home are briefly described. Data on the most common types and locations of such accidents are provided in tables. Characteristics of children and the home environment that contribute to accidents are briefly discussed. In conclusion, problems associated with accident prevention strategies, such as preventive home design and safety education, are discussed. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED202590

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CHILDREN'S SAFETY IN THE RESIDENTIAL ENVIRONMENT

SATYA BRINK, Ph.D.

Paper presented at the
First National Conference on
Childhood Accidents and Prevention
Ottawa, Ontario - 13-15 April 1981

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Satya Brink
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PS012192

CHILDREN'S SAFETY IN THE RESIDENTIAL ENVIRONMENT

Satya Brink, Ph.D.
Assistant Adviser
Children's Environments Advisory Service
Canada Mortgage and Housing Corporation

Paper presented at the First National Conference on Childhood Accidents and Prevention, Ottawa, Ontario - 13-15 April 1981.

To deal with the issue of safety, one must first be clear what an accident is. Though there is no doubt whatsoever regarding the result of an accident, the popular definition of the word is limited and even misleading. The distinguishing characteristics as stated in any dictionary definition are these: a sudden unexpected event resulting in loss or injury without apparent or known cause; an unexpected, unintentional act, occurring by chance, in an unpredictable random manner; also an unfortunate event resulting from carelessness, ignorance or a combination of causes.

Not all accidents are sudden, unpredictable, or without apparent cause and therefore unpreventable. For example: Environmental pollutants which are lethal may work slowly, building up dangerous levels of poisonous substances in the body, resulting in disease or fatalities. Children breathe in more air per unit body weight than adults, and they are often more exposed because many pollutants are heavy and settle near the ground. Yet, it is not unusual to find family housing projects exposed to industrial emissions, or parking areas near bedroom windows. Nor are accidents always unexpected resulting from unintentional acts. Children fall from low windows - and have been doing so for many years.

The home is rumoured to be a safe haven and a refuge. Yet more accidents happen in and around the home than in any other place resulting in 2,000 deaths a year and many more sustained injuries. Nothing is more dangerous than a cherished illusion.

Children are particularly vulnerable specially below the age of 4. Accidents are the leading cause of fatalities among the 1-4 age group, not including those caused by motor vehicle accidents which rank second. Together, these far outrank deaths by all forms of disease. Though there is general agreement regarding this fact, it is practically impossible to find clear supporting statistics or research information.

The only data collected specifically on accidents occurring in the home comes from in-patient cases recorded in Quebec hospitals. These figures do not include emergency room statistics, fatalities or unreported cases (Table 1).

TABLE 1

HOME ACCIDENTS
PROVINCE OF QUEBEC - 1979
NUMBER OF ACCIDENTS BY TYPE AND AGE GROUP*

Type of Accident	Age Groups		
	0 - 4 Years	5 - 9 Years	10 - 14 Years
Falls	917	492	366
Burns/Scalds	248	67	99
Electrical Appliances	2	-	1
Poison	461	36	48
Cuts and Bruises	323	177	193
Other	400	234	268
TOTAL	2,381	1,006	975
**TOTAL NUMBER CHILDREN 1976	442,660	485,615	622,070

* Data from number of in-patient cases recorded at Quebec hospitals; does not include emergency room statistics or unreported cases.
**Census, 1976.

It is clearly evident that preschool children are by far the greatest victims, particularly sustaining injuries from falls. To the totals must be added the number of children who are injured in fires, and in traffic accidents within sight of their home, for an accurate picture of the dimensions of the problem. And that is just for the province of Quebec!

Very little detailed data is available regarding the specific location in the home where children's accidents occur. A British study indicates that one-half the accidents involving preschoolers occur in the kitchen, living and dining room and about 10 per cent on the stairs (Table 2). Among accidents involving children 5-14 years of age, 25 per cent fall victim to accidents in the immediate vicinity of their home. Many of these are traffic accidents where the child is struck on his journey from or to school or while playing. For this age group, traffic accidents is the leading cause of death. There is

TABLE 2

HOME ACCIDENTS
BY LOCATION OF ACCIDENT

	Age Groups	
	0 - 4 Years	5 - 14 Years
Location	%	%
Kitchen	19.8	16.6
Living and Dining Room	36.0	23.3
Outside	14.2	27.5
Stairs	9.6	11.1
Bedroom	10.9	9.9
Bathroom and Toilet	3.4	3.6
Hall	3.4	4.8
Garage	0.6	1.0
Other	2.1	2.2
TOTAL	100.0	100.0

From a survey of domestic accidents in 6 selected areas conducted by UK Home Office, and Institute of Consumer Ergonomics, 1974. (19)
Data from Accident and Emergency Departments of Hospitals.

some evidence to support that sixty per cent of these accidents occur within a 400 m (two block) radius from the child's home, and a shocking 25 per cent right on the street in front of their home (13). Some evidence also indicates that child pedestrian accidents do not occur in areas of high speed traffic but in slow or disorganized traffic such as parking lots and service roads. Child pedestrian accidents seem to peak around the age of 9, just when parents loosen the apron strings and the child is trying out his new-found independence.

Adult supervision goes a long way in preventing accidents. However a Swedish study found that almost three fourths of the accidents occurred under conditions of supervision by a responsible adult. (2)

The first step in developing a viable action plan for prevention, attacking all facets of the problem, is to analyze the potential accidental event in terms of its elements: the victim, in this case the child, the home environment, and the pertaining condition or circumstances.

Children: Young children are developing physically, intellectually, socially and emotionally. They have not perfected physical control of their growing bodies, nor have they learned to cope with their complex living environment. Their perceptive skills are not developed and their judgement is inexperienced. They are immature and incapable of interpreting danger.

Children are particularly vulnerable because they are extensive users of domestic architecture and the immediate surroundings because of their limited home range. Succumbing to the natural urge for exploration, children will put features by their environment to uses not found in the normal range of adult behaviour. They slide down bannisters, climb fences, and crawl into cupboards.

Environment: The living environment is increasing in complexity, with many hidden risks and new hazards. Our once quiet streets are now choked with traffic. Our homes are full of technically advanced machines that pose dangers to children. We use many potent drugs and cleaning materials that are toxic. Pre-school children are particularly susceptible to injury. A British investigation showed the products that are most often associated with such accidents (Table 3).

TABLE 3

PRODUCTS RELATED WITH HOME ACCIDENTS IN THE 0-4 AGE GROUP

Products	Number of Cases Reported
Household furniture (coffee tables, chairs)	412
Construction (stairs, windows)	213
Kitchen utensils (knives, kettles)	129
Cleaning products	89
Plants and trees	81
Playthings and sports equipment	80
Household maintenance	76
Outside environment	72
Flammable and corrosive liquids	70
Household fixtures	68

From a survey of domestic accidents in 6 selected areas, conducted by UK Home Office and the Institute of Consumer Ergonomics, 1974. (19)

Data does not include products which are not under the jurisdiction of the Department of Prices and Consumer Protection, such as drugs, food, drink and motor vehicles.

Conditions: The prevailing conditions in the accident equation may also be tied to the environment. Poor visibility, for instance, due to insufficient lighting or inappropriate landscaping, may endanger a pedestrian. Accidents are likely to be avoided when supervision is possible or when family members are aware of potential danger.

Strategies for Accident Prevention: A preventive program must incorporate activities that minimize the risk of accidents in all three of these elements. Let us consider these strategies in turn.

We cannot expect much help from children. Safety education must be part of their learning process, but our expectations must not exceed their developing abilities. Good and consistent safety habits displayed by adults will be emulated in time. But too often we see a parent who tells the child to look both ways at a zebra crossing before he walks across the road, dragging along a youngster as he jay walks himself.

Children will learn safety rules, but they cannot be expected to remember them when engrossed in play because their cognitive abilities do not allow them to evaluate several problems at once. Development also implies environmental know-how. The child must learn to gauge his own physical abilities, judge distances and speeds by sight and sound, evaluate risks from environmental cues, and relate cause to effect, in the process of developing survival techniques from childhood experience. It takes time - about 10 years; some say 14. With physical development, and intellectual maturity grows the ability to function as an adult in an environment that is primarily designed for adults.

The home environment can be made safer by preventive design. Design is often responsible for accidents that happen to residents using their homes in ways that seem reasonable to them, but were not foreseen by the designer. Horizontal railings on balconies, for instance, are climbed by children. Infants put their head through railings and are unable to withdraw them. Preventive design ensures that the home is as inherently safe as possible. A designer cannot assume that toddlers receive unceasing supervision, or that the parent will resort to add-on protective devices that may be removed or may not work. Nor should the designer assume that the feature will always be used in the way that the designer intended, or that all residents will be aware of danger and take steps to avoid accidents.

What can be done to ensure that preventive design is practised? There is a considerable body of literature on safety, ranging from detailed safety checklists to safety norms for product design. However the

home buyer has no assurance that such material is consulted and applied. Nor is he certain the that periodic evaluations of design in use are carried out to upgrade safety data, or that new developments in the safety field become immediately available to the practicing professional.

The most obvious solution is safety education. But professional training often does not emphasize the safety aspects of design, nor does it promote an on-going interest in keeping up with new thinking regarding safety. The problem is further complicated by the fact that a very large proportion of family housing built is designed by builders who have no professional general training.

To attain a minimum standard of safety and to protect the consumer, governments resort to housing codes and residential standards that are enforceable by law. These are intended to serve as the bottom line for design but it is common for a designer to feel that compliance relieves them of further responsibility. Infractions are rarely reported. Even when action is taken few convictions result.

The debate rages among designers on the means to achieve good preventive design - regulation or education? Should regulatory codes prescribe mandatory safety requirements? Or should the designer be allowed to choose an acceptable solution to the design problem from a whole range of possible acceptable solutions? How detailed should regulations be without being seen as over-regulation? Could detailed mandatory specifications result in stereotyped design solutions that in fact are inappropriate for the situation? Let us consider, for example, a staircase. The residential standards specify stairway design in some detail. Steepness is regulated, and a handrail is compulsory. Gaps in balustrades should not exceed 100 mm. This, however, still does not deal with details such as open treads, inset treads, closeness to doors, surface materials or lighting. Most designers are not irresponsible but when the designer is faced with

constraints of cost or space, the trade-offs he makes may compromise safety. The resulting stairway design poses a built-in danger putting all passers-by at risk. It portends an accident waiting to happen, claiming the odd victim throughout the lifetime of the building while exacting a daily toll in terms of discomfort from every user.

New approaches to regulations as well as education of designers must be resorted to, because performance based standards imply a code of professional ethics that must be followed by them. Building regulations are also difficult to formulate because a design requirement might adversely affect one sector of the population, or cause conflict with other potential uses. For example, standards of street access may facilitate traffic movement, but are a threat to pedestrian safety. Needs for privacy conflict with the need for surveillance. A design solution must be evaluated in terms of the total picture. Does it impact on other qualitative factors? Children's bedrooms may have high clerestorey windows that they cannot fall out of, but children and every one else are deprived of the pleasure of looking out. It is a thin line between safety and over-protection. Human ingenuity must be applied to resolve such problems sensitively and effectively. The consumer has no choice but to look to the designer for responsible, enlightened solutions.

Cost is another reason given for poor safety provisions. Many safety features will only be provided at an acceptable price, but there is a limit to the freedom to cause risk of injury to others. The philosophical question regarding the value of life is one that is difficult to quantify so we let the market place decide. Unfortunately the all important question is asked by the home buyer only after the accident - "Is it worth it?". By then it is too late.

What can be done to minimize circumstances that cause accidents? These strategies can be labelled supportive design. A housing plan that facilitates supervision by the mother, working in a kitchen, without having the child underfoot, is an example.

Supportive design supports the individual in his daily round of activities by improving visibility, convenience, and ease of operation. It implies design for the lowest common denominator, to accommodate the diversity of human uses. Some call it "idiot proofing", others call it humanistic design. For instance, it is more realistic to plan for cleaning materials to be in child resistant containers and to be kept under the sink where the mother will put it anyhow rather than in the inaccessible cupboard. A much quoted British study (often facetiously referred to as the "blame study" (14 and 15) found that the causes of domestic accidents were as follows:

Personal factors	67%)	92%
Faulty maintenance	25%)	
Faulty design	8%	

Personal factors are described in the following way:

Mental: Children: curiousity, disobedience, temper, ignorance.
Adults: worry, temper, haste, fatigue, muddle, carelessness, depression.

Physical: Failing eye sight, hearing, impaired sense of smell, lack of sensation.
Physical disease, disablement, dizziness or faintness.

To accept these factors as unnatural is to deny children their childhood and adults their humanity. People, unlike standardized robots, are not endowed with uniform physical characteristics, nor can they be expected to perform at their peak. If you cannot be tired drop your guard, and relax in your own home, where can you? Besides, the inter-relatedness of these factors cannot be ignored. Fatigue can be induced by poor design, which may also invite faulty maintenance. Supportive design acknowledges human needs in design.

In the final analysis, the responsibility for the improvement of safety in the residential design lies with both the home designer and the consumer. The designer has been preoccupied with more concrete aspects of his design problem and the "soft" human element has largely

been ignored. It is an indictment that those involved in design are able to apply technical knowledge regarding metal fatigue but not human fatigue, that more is understood about the efficiency of machines than the functioning of individuals. The developing field of Human Factors Engineering is a start in the right direction.

The consumer is no less to blame. The consumer cannot deny the fact that he has supported poor design by purchasing it, by not demanding better design, by not protesting designs that compromised safety by not suing when justified. In other words, we watched silently and let it happen.

An array of preventive strategies have been considered - building regulation and housing standards, safety education of those involved in housing and product design, consumer education, adult supervision of children, stricter penalties and liabilities, research in human factors engineering and safety and self-imposed professional ethics and higher standards of design. All of these mechanisms are in use, and yet the results are not cause for celebration. Other countries have had greater success with the same approaches. Why? In Canada, we simply do not attach high priority to safety issues. We have not learned from the experience of other countries. We have not applied preventive strategies properly, consistently, or to their full extent. The strategies have not received professional or popular support.

The responsibility is ours. To protect Canadian children, every single one of us must make this commitment. Whenever faced with a decision that touches on safety, do not ask yourself if some hypothetical child, some time in the next fifty years, might be hurt, disabled, or killed by the decision you make. Make the decision as if it is your own life that is at stake. For as the poet so aptly put it - "Any man's death diminishes me, because I am involved in mankind; and therefore never send to know for whom the bell tolls, it tolls for thee" (John Donne).

REFERENCES

1. Anne S. Ackland. Home Safety Check List, Architects' Journal, 23 October 1963, pp. 839-840.

2. Berfenstam, Kagnar. The Work of the Swedish Joint Committee for Childhood Accident Prevention. In (12).

3. Boucher, C.A. Accidents in the Home. Monthly bulletin of the Ministry of Health and the Public Health Laboratory Service. 14, 49-50 (1955).

4. Boucher, C.A. The Medical Officer of Health and Accidents in the Home. Monthly bulletin of the Ministry of Health and the Public Health Laboratory Service. 11:2-7 (1952).

5. Canada Mortgage and Housing Corporation, Safety in the Home, Ottawa: CMHC - NHA 5186, 78/10.

6. Cargill, D. Accidents in the Home. Hamish Hamilton, 1967.

7. Children's Environments Advisory Service. Child Pedestrian Safety in Residential Environments. Ottawa: Canada Mortgage and Housing Corporation, CEAS Monograph 1, 1980.

8. Children's Environments Advisory Service. La sécurité des enfants vs la circulation - auto. Ottawa: Canada Mortgage and Housing Corporation CEAS research report 16, 1980.

9. Court, Donald. Conclusion. In (12).

10. Department of the Environment. Safety in the Home. London: HMSO, (UK) 1967.

11. The Hospital for Sick Children. Please make my World Safe. Toronto, Ontario: The Hospital of Sick Children Foundation, 1978.

12. Jackson, R.H. (Ed.). Children, the Environment and Accidents. Tunbridge, UK: Pitman, 1977.

13. Jackson, R.N. Setting the Scene. In (12).

14. Safety in Domestic Buildings - 1. Building Research Station Digest, Number 43 (second series). (UK), 1966.

15. Safety in Domestic Buildings - 2. Building Research Station Digest, Number 44 (second series). (UK), 1966.

16. Sandels, Stina. Children in Traffic. Elek Books Ltd., London, 1975.

17. Sinnott, W.R. Safety Aspects of Domestic Architecture. In (12).

18. Russam, K. The Psychology of Children in Traffic. In (12).

19. U.S. Department of Housing and Urban Development. A Design Guide for Home Safety. Washington, D.C.: Research and Technology Division, HUD, January 1972.

20. Whittington, Claire. Accidents in the Home - Results of a Preliminary Study carried out by the Home Office and the Institute for Consumer Ergonomics. In (12).